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Higher Education

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Abstract

During the last five years higher education research in Germany seems to be in a significant upturn. This is a side effect partly of the obvious boom of empirical educational research in general and partly of the reform movement that has affected the German higher education system since middle of the 1990s. The demand for data in the field of higher education will increase considerably in future. The available data infrastructure for higher education research in Germany consists of two complementary main sources: on the one hand the official higher education statistics, on the other hand survey-based research.

All in all, there are no serious or principle obstacles to access to the available data stock. Access in particular to some of the most important surveys could be improved by the establishment of a *Forschungsdatenzentrum* at HIS Hochschul-Informationen-System. Furthermore, there are some deficiencies in the present data provision. New topics and demands of data provision have to be integrated into official statistics and survey based research – e.g. such issues as migration status, competencies, lifelong learning, quality of studies, institutional effects, international mobility, programs to promote younger scholars etc.. In particular there is a lack of panel designs. The very new National Education Panel Study (NEPS) will eliminate some but not all of these deficiencies.

1. The development of higher education research in Germany – old and new research questions

In Germany as in other countries, higher education is faced with increasing pressure of justification in terms of demand, outcomes, effectiveness, study success and other issues which could be subsumed under the concept of accountability. Not only researchers but in particular politicians – at institutional, state or national level – are interested in information and data concerning the results and performances of higher education institutions giving the conditions of funding bottlenecks and more competition for students, scholars, reputation and resources. With the growing social and economic centrality of higher education, the academic as well as the political interest in data on the development and functioning of higher education is rapidly increasing.

Over the last five decades a wide range of academic and political issues of higher education has been the focus of empirical and non-empirical higher education research in Germany. Although higher education had been the subject of various academic efforts since the late 1950s, higher education research remained rather a side-track of social and educational research for a long time. As a result of the massive quantitative expansion of higher education over the last decades, colleges and universities have become one of the most important institutions, sometimes even the most important institution of professional education in modern knowledge-based societies. With respect to the overall upgrading trend in the qualification structures, higher education will become even more relevant – and as a part of this the academic and political interest in higher education will also increase considerably.

During the last five years higher education research in Germany seems to be in a significant upturn. This is a side effect partly of the obvious boom of empirical educational research in general and partly of the reform movement that has affected the German higher education system since the middle of the 1990s. As with empirical educational research in general, higher education research seems to have profited from the new paradigm of evidence-based educational policy. As an element of this, the establishment of continuous monitoring systems at different levels (international, national, state) including higher education, e.g. the German national educational report (Avenarius et al. 2006; Klieme et al. 2008), has rapidly reinforced the need for elaborated data infrastructure. The fact that, currently, the higher education system in Germany as in other countries is subject to a lively

public reform debate and is facing several reform challenges (Wolter 2004; 2007a) has also stimulated an increasing interest in higher education research.

Because higher education research has covered a broad range of research questions and topics it is difficult to encompass the diversity of research activities over the last years into a few selected main lines. However, it may be possible to distinguish the following four main fields of research (Teichler 2002):¹

- *the quantitative-structural change of higher education*: this area of questions includes the development of social demand for higher education, the consequences of the massive “massification” for the system as a whole and the particular institutions, the institutional structure of higher education and its changes (e.g. through diversification, profiling or vertical/horizontal differentiation), the provision of studies, the interdependencies between the expansion and types of differentiation etc.;
- *transitions and processes of studies*: a lot of research has referred to such topics as the first transition point, that means the status-passage between school and higher education, access and admission, social inequality and opportunities to study, the social and economic conditions of studying, processes and success of studying (including the drop-out phenomenon) and their determinants, teaching and learning, student mobility; furthermore the second transition point from higher education to the labour market and employment, early vocational careers, the match between higher education and employment and similar questions;
- *post-graduate training and academic staff*: this field embraces such topics as the different stages and paths to a professorship, in particular the effectiveness and quality of doctoral programs, the main activities and time-budget of the academic staff, faculty development, employment conditions and career perspectives especially of young scholars etc.;
- *organization, management and governance of higher education*: this field includes, at system or institutional level, such topics as the external relationships between state and university, the internal organization of institutions, issues of efficiency, funding higher education, professional institutional management, new concepts and procedures of steering and allocation, evaluation and quality assurance etc.

¹ Because of research being the second pillar of higher education another important field represents research on research or on science, which is the subject of another article (Stefan Hornbostel, in this volume).

The kind of data required varies with these research questions and fields. Whereas the first three areas require primarily data at national level, most research about the steering and governance topics depends on the availability of data primarily at institutional level. The following explanations focus on available data stocks and new data requirements primarily at national, not at institutional level. For the same reason the new wave of ranking procedures with their enormous demand for differentiated data on the performances of higher education institutions (Bayer 2004; Statistisches Bundesamt 2007) are not the subject of this report.

Sometimes, it is difficult to differentiate strictly between old and new research questions. Old questions often remain relevant over time or become significant again in a changing context. For example, the consequences of the continuous expansion of participation in higher education for the changing relationships between higher qualification, profession and employment were already a lively debated issue in the early 1970s. But these issues became relevant again with the new wave of expansion since the 1990s. And they will retain their relevance with the recent political consensus that higher education in Germany should aspire to a participation rate of 40 % of the corresponding age group and a graduate rate of 35 % (Wissenschaftsrat 2006) to keep pace with other highly developed countries. Therefore, such issues as unemployment of graduates or adequacy between qualification and employment have always been acute questions even if they are now analyzed in a methodologically more differentiated way and in the changed context of the rising knowledge-based society.

However, new questions and topics have arisen in the context of these enormous changes – which could even be called a fundamental transformation – of German higher education during the last decade:

- *The impact of the Bologna process:* During the last years there has been a considerably increasing interest in the results of the Bologna process on studies and studying (Teichler 2008; ZSE 2008). At a structural level changes in the relationships between different types of institutions, e.g. trends of convergence, and in the provision and organization of courses are the focus of interest. But “Bologna” includes more than new degrees and a consecutive structure of studies; this notion indicates a radical change of study cultures including teaching and learning styles. So, at an individual level, the study motivation and the learning behavior of students and their adaptation to the new configuration of studies is of great interest. This will result in an expanding demand for related data particularly from student research.

As the Bologna process proclaims employability – whatever this concept means (Schaeper and Wolter 2008) – as an objective of studies, further research will also focus on the transitions between higher education and work. So there is (and will be) an obviously increasing interest in graduate studies as cross-sectional or even more productive as panel studies (HRK 2007). Furthermore, research will be concerned with the outcomes of studying, especially in terms of disciplinary competencies as well as transdisciplinary, so-called key competencies (Schaeper 2005; Schaeper and Spangenberg 2007). Last but not least the differentiation between initial and continuing studies has become blurred with the Bologna process, which has strengthened the perspective of lifelong learning as a main mission of higher education. But particularly in the area of continuing higher education there is a completely disparate and inadequate provision of data (Wolter 2007b).

- *Internationalisation of higher education:* The internationalisation of higher education – possibly globalisation or Europeanisation or in other forms (Teichler 2004) – has led to a growing need for internationally comparative data. Nowadays, higher education institutions are often considered to be institutions acting on a global market with global competition. Consequently, research on higher education has to take into account this international or even global character. During the last decade this internationally comparative perspective has been reinforced primarily for two reasons. Firstly, there is a political demand for comparative analysis of the strengths and weaknesses of higher education systems and institutions in order to identify concepts or models to reform institutions. The same is true for concepts and procedures of quality assurance. Secondly, the establishment of a European Higher Education Area in the course of the Bologna process has reinforced the former interest in student or staff mobility. As a result there is a growing need for valid international data on higher education, in particular on student mobility (Kelo et al. 2006).
- *Differentiation and governance of higher education:* The growing stratification of the German higher education system in the course of the excellence program and other mechanisms of differentiation is another area of growing interest. Although these “excellent” institutions (in the three areas of graduate schools, clusters of excellence and future development concepts)

have been selected in a state regulated nomination procedure rather than in a market-shaped process of competition, based on reputation and performances, the claim of excellence requires in the long run an academic justification by measurable criteria. This will result in an increasing need for data concerning the achievements of higher education institutions primarily in the areas of research, but probably also teaching (Hornbostel 2008a; b). Research on the results and changes, which the progressive realization of new governance and steering structures will generate, will be another important future research area (Wolter 2007a). But both these questions are still in their infancy because the dynamic of these changes are at an early stage. Both require, as already mentioned above, special data particularly at institutional and not at national level.

2. The current state of data infrastructure and the challenges in higher education research

The available data infrastructure for higher education research in Germany consists of two main sources:

- on the one hand the official higher education statistics including the student, the personnel and the finance statistics and,
- on the other hand, data and results from survey-based research in particular in the field of student and graduate research that has been (and is being) conducted by research centres such as the Higher Education System (HIS) GmbH, Hanover, the International Centre for Higher Education Research (INCHER) at the University of Kassel, the *Arbeitsgruppe Hochschulforschung* at the University of Konstanz and other centers.

In principle, the availability of and access to public data and survey data is ensured. But outside the official statistics, research institutes or centers are often faced with obstacles due to lack of personnel or technical capacity. From an international point of view, higher education research may be more developed in other countries than in Germany related to the size of national higher education systems. But the main problem in German higher education research does not primarily consist of a lack of data but rather a lack of extensive and methodologically sophisticated utilization of the existing data stocks. So, access could be improved – not legally but practically.

Since the early 1970s, as a result of the higher education statistics law, official student statistics have been presented annually (by the Statistical Offices at state or federal level). These statistics provide a lot of data on the number of students (new entrants or all), their distribution over institutions and subjects, partly their composition (gender, nationality), their regional origin, kind of study entitlement and other variables. As opposed to the official school statistics, the higher education student statistics have consisted of individual data sets since the 1970s, so it is not necessary to establish individual statistics in this field. The official student statistics allow many very differentiated analyses, e.g. on the development of (realized) student demand, on regional student mobility, duration of studies, fluctuation between subjects and other aspects. However, there are some important limits and deficits.

- Firstly, it has not been possible so far to link the separately organized school and higher education statistics individually. So, even if it is possible to calculate general transition quotas, the transitions from grammar school to university cannot be reconstructed as individual processes. Thus the introduction of an overarching identity number in educational statistics would be an important measure to analyze processes and transitions. This, however, faces serious problems of data with respect to data protection and public acceptance.
- Secondly, a lot of important variables are not part of the official statistics, e.g. the social origin, the migrant status of students (except the formal nationality) or any subjective variables. The provision of such data depends completely on student survey research.
- Thirdly, the student statistics end with exmatriculation, so of course the further life-course, in particular the professional or academic career of graduates, is not part of the student (or other) statistics. Because of this, graduate survey studies are of such importance. Some data about the employment of graduates can be gained from the the Socioeconomic Panel and the Microcensus, but not with the necessary depth of focus as could be obtained in graduate studies.
- Fourthly, the official statistics include only a very few variables (such as duration of studies) which can be used as indicators for the quality of studies. One of the most important lacks concerns the provision of valid and reliable data on student drop-out. This is partly due to legal objections, partly to difficulties in the precise definition and measurement of the drop-out rate. Empirical information has been generated so far primarily by estimate models developed from the Higher Education Information

System (HIS) (Heublein et al. 2008). Currently, a joint project between the Federal Statistical Office and HIS is being carried out to deliver valid data on student drop-out.

- Fifthly, official statistics do not include the *Berufsakademien* as a hybrid type of institution between tertiary and post-secondary education. *Berufsakademien* are not established in all German states, but where they exist they are often considered as the third pillar of the German higher education system showing a high degree of curricular overlapping with the *Fachhochschulen*.

Because of these deficits in the official statistics, student survey research is of central relevance for the data infrastructure of higher education research. In certain respects the official higher education statistics and the survey-based research and data production can be considered as a complementary system shaping the research data infrastructure in the field of higher education. Survey projects can be conducted as single projects or as follow-up projects in order to build up time series. In Germany, several such follow-up studies with different target groups have been carried out since the late 1970s. They include school-leavers with a study entitlement, new entrants in higher education, students and graduates.

The Higher Education Information System (HIS) regularly undertakes various cross-sectional surveys among school-leavers holding a study entitlement (*Abitur* or *Fachhochschulreife*) and among new entrants in higher education. The focus of these studies is on the decision process to study (or not), the choice of institution and subject and the individual and social factors determining these decisions (Heine et al. 2008a; b). Partly, the HIS school-leavers survey has been continued as a panel during the first sequence of studying. On the basis of these surveys it is possible to reconstruct the status passages between school and university as a time series for almost three decades. However, there are only a few longitudinal studies examining the complete transition process from school into higher education starting in the upper stage of the grammar school and ending at a later point of time during studying. Some of these panel studies show a very sophisticated methodological design, but are limited to a particular state (e.g. the TOSCA-study, cf. Köller et al. 2004).

Concerning students (over all sequences of studying) there are two larger projects worth mentioning which have usually been updated every three years. The social and economic situation of students and conditions of studying have been examined by the *Sozialerhebung*, also carried out by HIS since 1982 (Isserstedt et al. 2007). As a part of what is called the social dimension of the Bologna process, a European-wide study on the social and economic conditions of studying (called Eurostudent) has been established which is also co-ordinated by HIS (Eurostudent 2008). The study situation, study problems and the individual orientation of

students have also been investigated since the early 1980s by the so-called *Konstanzer Studierendensurvey* (Multrus et al. 2008). Based on this survey there have been some additional differentiated special analyses about certain subjects (e.g. humanities or engineering) or certain groups of students (e.g. female). Most of this type of student research is conducted as cross-sectional surveys.

Graduate studies are an exploding field of research. Most of these graduate studies focus on a retrospective assessment of studies and their outcomes, on the transition from university to employment, the occupational or academic career after the first degree and other aspects of the further life course (e.g. mobility or participation in continuing education). Since the late 1980s, there have been two research contexts at national or international level that provide representative data for Germany. Starting in 1989, HIS established graduate studies not only as a longitudinal study but also as a time series. HIS questions a large graduate sample representative for Germany every four years with up to three panel stages, during the first, the fifth and (in future) the tenth year after graduation (Briedis 2007a; b; Kerst and Schramm 2008). Co-ordinated by the International Centre for Higher Education Research at the University of Kassel (INCHER), two internationally comparative graduate surveys have been undertaken – CHEERS² (Schomburg and Teichler 2006; Teichler 2007a) and REFLEX³ – which also embrace a larger German graduate sample and place it in a European comparison.

Additionally, numerous studies have been carried out at local university or faculty level during the last years. Many institutions are interested in the success and careers of their graduates as an indicator of academic performance or quality of studies. In the meantime, graduate studies have also been established in three of the German states (Bayern, Rheinland-Pfalz, Sachsen). So, graduate studies are one of the main growing research areas. But despite or even because of the proliferation of local and regional studies graduate surveys at national level will retain their relevance as a benchmark for local and regional studies.

All in all, the research data infrastructure for higher education research based on the complementary relationship between official higher education statistics and the diversity of surveys is not bad. Nevertheless, there are some essential deficits in research and data provision.

- Firstly, there is a lack of longitudinal studies that follow a cohort of students from the upper level grammar school stage (or at least from entry to higher education) through their studies until their transition to employment and the first phase of vocational

2 Careers after Higher Education – A European Research Study.

3 The Flexible Professional in the Knowledge Society.

activities (with the exception of Meulemann's longitudinal study (Meulemann et al. 2001) based on a cohort of grammar school graduates). Most of the existing panel studies concentrate on only one transition point – either access to higher education or to employment. This deficit is another reason why the drop-out phenomenon has not been explained sufficiently.

- Secondly, despite the fact there are some student surveys exploring the situation and difficulties of students during their studies, there is a lack of data concerning the interrelations between institutional contexts and the processes and outcomes of learning in higher education institutions. The relationships between internal contextual and institutional conditions at different levels (classroom, program, faculty, institution as a whole), personal attitudes and behavior and the outcomes of learning, also the influence of outside learning settings is obviously a serious research desiderata. So, the actual impact of the institutions on learning and the outcomes is not really clear (Pascarella and Terenzini 2005). Of course, this is a theoretically and methodologically very ambitious area in view of the multi-causality of dependent, independent and intervening variables, but a venture of central importance – not only academically but also politically. The manifest trend towards more differentiation in German higher education through profiling, ranking and excellence inevitably provokes the question of the particular influence of institutions and study programs on the learning outcomes as well as on the later employment situation and career courses (Teichler 2007b).
- Thirdly, there is a considerable deficit in research and knowledge about competence development through higher education. Competencies as the subject of higher education research are still a relatively new field of research that has become increasingly important with the Bologna process. First of all, it is necessary to distinguish between at least three different types of competencies: (1) subject- or discipline-related competencies, (2) cross-curricular competencies, often also called key or generic competencies including social skills, which can normally not be acquired through learning processes independently from discipline-related learning but should be measured in their own way, and (3) competencies to act professionally in vocational demand situations. During the last ten years, there have been several attempts to measure student or graduate competencies in Germany but mostly only cross-sectional, primarily for cross-curricular competencies and based mostly on self-assessment or self-report measures (Schaeper 2005; Schaeper and Spangenberg 2007).

Valid measurement procedures for competence development, based on competence tests, are very rare; in the field of discipline-related competencies they do not exist (apart from a very few pilot studies for selected subjects).

- Attempts to develop and to practise competence measurement procedures have to cope primarily with two main problems: (1) with the high diversity of discipline contexts in higher education, which is different to the school system with its core curriculum and a small number of subjects, and (2) with a completely different target group and institutional context that makes it more difficult to implement test-based procedures of competence measurement for students – even more so for graduates – than it is in the case of pupils and classroom situations including problems of acceptance. However, there is no doubt about the relevance and necessity of the development and implementation of more elaborate procedures of competence measurement in higher education, in particular to address the question whether (or to what extent) institutions and programs actually impart the competencies they should and to what extent other formal or informal learning settings intervene in this process.

Some of these questions and issues are the subject of the recently established National Educational Panel Study (NEPS) (Blossfeld 2008; Blossfeld in this volume) which also includes a student cohort. The NEPS focuses on a number of aspects: firstly, on the development of competencies through higher education, mainly of cross-curricular competencies; secondly, on the influence of institutional settings and contexts; and thirdly on the educational decisions and courses including the extent and conditions of success and drop-out. So, in the long-term the NEPS will provide empirical information and knowledge exactly in some of the deficit areas which have been specified before. However, the NEPS limits the measurement of subject-related competencies to two selected disciplines and concentrates primarily on cross-curricular competencies.

Gender problems and issues have been dealt with in many different forms in higher education research. Whereas the participation of women in higher education has continuously increased over the last decades and, in the meantime, is higher than that of men at least at university level, there are still large disparities between the subjects. Particularly the low degree of female participation in engineering and some sciences has caused concern and attracted special attention. The success rate of women is higher than that of men or, the other way round, the drop-out rate is lower. Since 2000, more females than males have graduated from universities every year, and since 2003, also from the complete higher education system (Klieme et al. 2008, 133, 302). It seems that the future of human capital, particularly of the

highly qualified workforce, depends more and more on the supply of qualified women on the labour market. According to these trends some new questions arise with regard to the response of the employment system. For example, transitions of female graduates, their particular employment chances and conditions, career perspectives and also the compatibility of work and family will become or remain very important issues.

Migration has been rather a marginal issue in German higher education research so far. First of all, it is necessary to distinguish between students with a migration status and internationally mobile students who do not have residential status in Germany but stay here for the purpose of their studies. The official higher education statistics register migration only in a very narrow interpretation, based on nationality. According to this definition, approximately 3 % of all students are migrants whereas the proportion of migrants in the population is about 9 % (Avenarius et al. 2006, 140, 273). Based on a wider (but not exhaustive) definition of migration background, including *Bildungsinländer*, students with double nationality and naturalized students, the proportion of migrants in the student body comes to about 8 % compared with a proportion of this group of about 19 % in the population (Isserstedt et al. 2007, 435). Obviously, migration has been up to now only a peripheral topic in higher education research resulting in a lack of data and empirical knowledge, despite the fact that a higher rate of participation of migrants would be a new source of social demand.

Whereas research and data provision on students and studying is relatively well established the state of research and data in the field of academic recruitment and academic staff is not satisfactory in the same way. Even if the official personnel statistics can deliver a lot of quantitative and structural information, there have not been any regular parallel surveys up to now – either for young scholars or for the complete academic staff. Furthermore, the official statistics cannot deliver any reliable information about the volume, the paths and the situation of the new academic generation. In this area a lack of quantitative information and some important research desiderata dominate (BMBF 2008; Burkhardt et al. 2008).

Because of the current generation change in the academic staff and the high demand for scholars not only from higher education institutions but also from the non-university research sector, the state of data provision in this area is absolutely unsatisfactory. However, some empirical, partly comparative studies have been carried out during the last years concerning the situation of young scholars and the paths of qualification and employment on the way to a professorship (Enders and Bornmann 2001; Enders and Mugabushaka 2005; Burkhardt 2008; Kreckel 2008) showing the urgency of the problem. But neither the number of young scholars, currently employed at German universities as the coming generation of professors

(*wissenschaftlicher Nachwuchs*), nor the number of PhD-students is precisely known. The same is true for the expanding group of Post-docs.

Most quantitative information in this field is based on estimates, case studies or other limited projects. The success rate of PhD-candidates is unknown as well. At best, the number, situation and success of PhD-candidates in graduate schools or with another scholarship can be or has been examined, but this group represents only a small proportion. One reason for this insufficiency in data provision is the individual diversity and heterogeneity of the qualification routes, in particular to acquire a PhD-degree, and of the employment conditions within and outside universities. Presently, some panel projects are being established or planned to collect more and better data on the number, routes, situation, problems and success of this group – e.g. the PhD-panel “ProFile” and the online-panel “WinBus”. Graduate panel studies with a sufficient sample volume could be another opportunity to improve the state of information and knowledge in this area.

3. Conclusions and recommendations

The demand for data in the field of higher education will increase considerably in future. This growing need is due to the rising social and political importance of higher education in post-modern societies as well as to the implementation and extension of monitoring systems including higher education. In Germany, a complementary infrastructure of research data has been being developed since the 1970s consisting of the official higher education statistics and some survey-based regular data and information sources. In future, the National Educational Panel Study (NEPS) will significantly extend the existing system of data provision. However, there are some obvious deficiencies in the present data infrastructure, and because of this the following measures should be taken.

- **Access to data stocks:** All in all, there are no serious or principle obstacles to access to the available data stock. This is true not only for the official statistics but also for the survey-based data. But access could be improved from a practical point of view. Because the Higher Education Information System (HIS) is the institution outside the official statistics providing the largest data stocks relevant for higher education research a Research Data Center (*Forschungsdatenzentrum* (FDZ)) should be established at HIS.
- **Diversification of higher education:** In the area of official higher education statistics the *Berufsakademien* should be included in the student or personnel

statistics (and also in surveys). This would take into account that the structures of higher education in many countries become blurred because of the hybrid status of some institutions between post-secondary and tertiary education and the increasing permeability between these institutions. Another important point concerns the revision of the list of disciplines in the higher education statistics because the number and the degree of specialisation of subjects have strongly grown and provoked several serious problems of allocation.

- **Personal identity number:** The introduction of an identity number for all participants in educational programs would allow us not only to link the future individual school statistics with the already given individual student statistics to pursue transitions and further routes of training and education but also to improve processing data, in particular with respect to drop-outs and national and international mobility. This will certainly be a delicate issue but nevertheless an important academic demand for the official statistics.
- **Continuation of survey-based time series:** Much data and information in higher education depend on regular survey research. But this kind of survey research is based on applying for every individual project. The future availability of this data provision as the second pillar of the research data infrastructure depends completely on the continuation of these surveys. Therefore, a long-term planning certainty is of almost constitutive importance for the data infrastructure in higher education research.
- **Indicators for quality of studies and studying:** Official statistics and survey-based research together should develop and implement a joint set of quality indicators to exploit the available data stock in a comprehensive way with regard to the increasing demand for quality assessment in higher education. Quality of studies or institutions will become one of the central issues in future higher education policy and research.
- **Longitudinal design and process data:** In student research the most serious deficits are the lack of longer panel designs, of competence measurement and of studies that can explore the interrelations between contextual and institutional features, personal characteristics, the processes of studying and learning and the learning outcomes. The NEPS will probably improve the state of knowledge in this field considerably. But longitudinal research should be intensified in general, not only in the context of NEPS. Furthermore, there

should be further pilot projects to initiate and promote the development and testing of procedures for the discipline-related measurement of competencies, but at the first stage only for a few selected subjects but primarily such not included in the NEPS.

- **Graduate and competence studies:** Graduate studies, especially panel studies, will become even more important at all levels – at local or state, national or international level. At national level, graduate studies are indispensable as a comparative point of reference. Particular attention should be drawn to the role of institutions and programs for the allocation of position and status in the employment system. The match between qualification and employment and, in particular, the role of competencies acquired during studies to cope with the later occupational requirements are not really clear. It can be expected that the trend towards more horizontal and vertical differentiation between universities will also affect the importance of institutions for employment and the future career perspectives.
- **Academic careers and young scholars:** As a part of graduate studies research on the situation and further development of PhD-candidates should be intensified. The lack of reliable information in the area of employment conditions and career paths of the younger generation of scholars, even with regard to the number of young academics or PhD-candidates or to their success rate, indicates one of the most alarming deficits in the data infrastructure of higher education research. Therefore, the improvement of data provision concerning the qualification routes to an academic career remains a matter of high priority.

To sum up it may be possible to say that the current state of data provision in higher education research often reflects (not completely, but in many aspects) questions, issues, definitions and methods which emerged during the 1970s and 1980s and which have been only partly adapted up to now. Many new academic or political topics and demands on data provision have arisen since this time – e.g. such issues as migration status, competencies, lifelong learning, quality of studies, differentiation, programs to promote younger scholars, international mobility, outcomes, employability etc. – and have had to be integrated into the existing data programs. Obviously, this venture is not finished yet. Surveys have proved to be more flexible in many respects than the often very inflexible official statistics.

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